US Army Corps
Of Engineers
Wilmington District

PUBLIC NOTICE

Issue Date: July 5, 2006
Comment Deadline: August 7, 2006
Corps Action ID #: SAW-2006-32753-016

All interested parties are hereby advised that the Wilmington District, Corps of Engineers (Corps) has received an application for work within jurisdictional waters of the United States. Specific plans and location information are described below and shown on the attached plans. This Public Notice and all attached plans are also available on the Wilmington District Web Site at www.saw.usace.army.mil/wetlands

Applicants:

Town of Emerald Isle
7500 Emerald Isle Drive
Emerald Isle, North Carolina 28494

Town of Pine Knoll Shores
100 Municipal Circle
Pine Kno11 Shores, North Carolina 28512

Town of Indian Beach
P.O. Box 306
Salter Path, North Carolina 28475

AGENT:

Coastal Science & Engineering (CSE).
P.O. Box 1643
Morehead City, North Carolina 28557

Authority

The Corps will evaluate this application and a decide whether to issue, conditionally issue, or deny the proposed work pursuant to applicable procedures of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.

Location

The project site is located on Bogue Banks and incorporates portions of the shorelines of the Towns of Pine Knoll Shores, Indian Beach, and Emerald Isle (Sheet 1 of 12) in Carteret County, North Carolina. The proposed renourishment area will consist of approximately five reaches totaling up to 54,658 ft (cumulative) along Bogue Banks (Sheets 2–3 of 12).

Applicant's Stated Purpose

The Towns of Emerald Isle, Pine Knoll Shores, and Indian Beach recognize that oceanfront properties are a valuable public economic and ecological resource. FEMA has an established program that provides reconstruction of engineered beaches when severely eroded by hurricane events. The objective is to maintain the protective berm. From an economic perspective, the need for the proposed post-*Ophelia* beach renourishment project is to protect and preserve the largest portion of the towns' overall economy and tax base. Property damages and dune erosion during *Ophelia* were minor along the proposed project area compared with damages after Hurricane *Floyd* in September 1999 (CSE 2000). Nearly all walkovers remained intact, and debris on the beach was insignificant. The purpose of the proposed project is to restore the width of the protective berm to its prestorm condition so that oceanfront resources will be protected in the event of another storm.

Project Description

The following description of the work is taken from data provided by the applicant. The proposed project consists of excavating by hydraulic dredge up to 1,107,560 cy of beach-quality sediment from the Offshore Dredged Material Disposal Site (ODMDS), situated ~2 miles offshore of Atlantic Beach (Sheet 1). Shallow excavations (~2-5 ft deep, typical) would be made by hopper dredge and pumped via submerged pipe to the beach. The FEMA-approved renourishment area will consist of approximately five reaches totaling up to 54,658 ft (cumulative) along Bogue Banks (Sheets 2–3). The reaches are listed in Table 1.

Sediment would be spread via land-based equipment and shaped into a recreational beach between the existing toe of the foredune and the low watermark. The beach fill will impact ~460 acres of beach and inshore area. The main fill portions of the project will contain ~20 cubic yards per linear foot (cy/ft) of beach (1,107,560 cy total) and will include a flat berm at elevation +7.0 ft NGVD initially placed 85–145 feet (ft) wide (Sheets 7–10) and extending seaward to a depth of (~)–11 ft NGVD on a 1 to 15 slope. The fill volume for each reach varies according to the site-specific erosion losses during *Ophelia*. A taper 1,000 ft long at the eastern ends of Reaches 2 and 5, and 500 ft long at all other reach terminuses will tie the main fill into the natural shoreline at the ends of each reach (Sheets 2–3). Lengths and volumes for each reach include the planned taper sections.

The beach fill material will be dredged from a borrow area in the ODMDS (Sheets 4–6) that has been identified by the US Army Corps of Engineers for disposal of dredged material from Beaufort Inlet and Morehead City Harbor. Preliminary sediment characteristics in the borrow area from recent borings are given on Sheets 11–12. Material placed on the beach will be monitored continuously for sediment quality. Monitoring will include visual classification with confirmation by sieve analysis of representative samples collected on a daily basis. Preproject sampling of the borrow area is being used to identify areas where sediment compatibility can be maximized.

Table 1. Preliminary reach lengths and nourishment fill volumes for Emerald Isle, Indian Beach/Salter Path, and Pine Knoll Shores.

(1) Reach lengths include 500 ft taper section at beginning and each end of reach. Reaches 2 and 5 have a 1,000 ft taper at west end of reach and a 500 ft taper at east end.
(2) Unit fill volume calculations include taper sections.

Nourishment Reach	(1) Reach Length (ft)	Project Station	Locality	(2) Unit Fill Volume (cy/ft)	Reach Volume (cy)
Emerald Isle					
1	13,604	10--20	Conch Court To Lee Avenue	20.00	262,080
2	14,059	33--45	Gregg Street to 6th Street	23.07	307,080
Total	27,663			21.75	569,160
Indian Beach					
3	13,389	48--58a	300 ft east of 1st Street to apartment complex at east town boundary	23.17	298,604
Total	13,389			23.17	298,604
Pine Knoll Shores					
4	3,478	62a--65	300 ft east of Murex Drive to 3,700 ft east of Murex Drive	20.00	59,560
5	10,128	66--73a	Bogue Shores Club to Middle of Pinewood Road	19.22	180,236
Total	13,606			19.41	239,796

Beach Fill Design and Project History

The following description of the beach fill design is taken from data provided by the applicant. CAMA Permit # 124-01 and USACE Permit #200000362 outline the original formulation and data sources for the Bogue Banks nourishment project (Phases 1 and 2 accomplished between December 2001 and April 2003). Following completion of Phases 1 and 2, the applicant (2003a,b) documented nourishment volumes placed along the Towns of Emerald Isle, Pine Knoll Shores, and Indian Beach. Hurricane *Ophelia* impacted Bogue Banks in September 2005. Following the storm, the applicant resurveyed 43 profile lines and documented nourishment volume losses totaling 1,107,560 cy from the eastern town limit of Pine Knoll Shores to the western end of Emerald Isle (CSE 2005, letter dated September 28, Post-*Ophelia* Beach Changes).

FEMA representatives inspected the beach after Hurricane *Ophelia*, subsequently authorizing poststorm renourishment totaling 1,107,560 cy under project work sheets PW #38 (Emerald Isle), PW #39 (Pine Knoll Shores), and PW #40 (Indian Beach). The proposed fill profile and project dimensions (Sheets 7–10) are based on the FEMA authorization. This volume will restore the project area (Phases 1 and 2) to prestorm conditions. The renourishment will be accomplished by adding sand from a nonlittoral source (ODMDS) at generally 20 cubic yards per linear foot so as to replace the eroded material. The original project (CAMA Permit # 124-01 and USACE Permit #200000362) was formulated for a longevity of "10 years." The proposed renourishment is intended to maintain this longevity.

Methods of Construction

The following description of the construction methods is taken from data provided by the applicant. The proposed fill will be placed by ocean-going, trailing suction hopper dredge(s) between the seaward crest of the existing dry beach and the outer bar. Only the profile above high water is controllable in nourishment construction. Intertidal and underwater portions of the profile will be subject to natural adjustment by waves. The fill will be placed no higher than +7 ft NGVD (the natural elevation of the berm).

Work will progress in sections within the borrow area and along the beach. Fill placement along the beach will typically progress at a rate of 400-700 ft per day. Construction activities will involve movement of heavy equipment and pipe along ~1 mile reaches over a period of 1–2 weeks. Once a section is complete, piping and heavy equipment will be shifted to a new section and the process repeated. As soon as practicable, sections will be graded and dressed to final slopes. Other than at equipment staging areas, beach residents along the project area will experience disruption due to construction for several days or less.

Land-based equipment will be brought to the site over public roads and will enter the beach at existing permanent beach access areas identified on the permit drawings. Any alteration of dune vegetation/topography necessary for equipment access will be repaired to preproject conditions. Daily equipment staging will be on the constructed beach seaward of the dune line. Existing dunes and vegetation on the beach will be avoided and preserved. Construction contracts will provide for proper storage and disposal of oils, chemicals, and hydraulic fluids (etc) necessary for operation in accordance with state and federal regulations.

Equipment –*Trailing Suction Hopper Dredge*

Hopper dredges will dredge material from the designated ocean borrow area. Hopper dredges typically require ~25 ft minimum operational depth and are efficient for excavating shallow cuts on the order of ~2–5 ft. During excavation and loading, the slurry drains overboard via scuppers, discharging fine materials in the borrow area and leaving coarser material in the hopper. When loaded, the dredge travels to a temporary mooring and submerged pipeline near the project site. It connects to the pipeline and pumps the material from the hopper to the beach where it is spread mechanically by bulldozers. This is the same type of dredging placement operation used for construction of Phase 1 and most of Phase 2 of the Bogue Banks beach nourishment projects completed in winter 2001-2002 and 2002-2003 (respectively).

Construction Schedule

The proposed project involves dredging and placement of 1,107,560 cy of beach-quality sand. Based on the project experience of Phases 1 and 2, one hopper dredge can excavate and place on the order of 10,000-15,000 cy in a 24-hour period. The average production per day varies widely according to transportation distance and specifications of the project. It is anticipated that the proposed construction will be accomplished in approximately five months. Consistent with CAMA Permit # 124-01 and USACE Permit # 200000362, construction will take place within the previously approved environmental window (November 16 through March 31).

Other Required Authorizations

This notice and all applicable application materials are being forwarded to the appropriate State agencies for review. The Corps will generally not make a final permit decision until the North Carolina Division of Water Quality (NCDWQ) issues, denies, or waives State certification required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice in the NCDWQ Central Office in Raleigh serves as application to the NCDWQ for certification. A waiver will be deemed to occur if the NCDWQ fails to act on this request for certification within sixty days of the date of the receipt of this notice in the NCDWQ Central Office. Additional information regarding the Clean Water Act certification may be reviewed at the NCDWQ Central Office, 401 Oversight and Express Permits Unit, 2321 Crabtree Boulevard, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for

certification under Section 401 of the Clean Water Act should do so in writing delivered to the North Carolina Division of Water Quality (NCDWQ), 1650 Mail Service Center, Raleigh, North Carolina 27699-1650 Attention: Mr. John Hennessy (NC Department of Transportation projects) or Ms Cyndi Karoly (all other projects) by August 7, 2006.

The applicant has certified that the proposed work complies with and will be conducted in a manner that is consistent with the approved North Carolina Coastal Zone Management Program. Pursuant to 33 CFR 325.2 (b)(2) the Corps is, by this notice, forwarding this certification to the North Carolina Division of Coastal Management (NCDCM) and requesting its concurrence or objection. Generally, the Corps will not issue a Department of the Army (DA) permit until the NCDCM notifies the Corps that it concurs with the applicant's consistency certification.

Essential Fish Habitat

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The Corps' initial determination is that the proposed project may adversely impact EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils or the National Marine Fisheries Service. These impacts to EFH include destruction of habitat at the fill site, siltation plums, erosion and sedimentation issues, time frame work is performed (fish moratoriums) and water quality issues.

Cultural Resources

The Corps has consulted the latest published version of the National Register of Historic Places and is not aware that any registered properties, or properties listed as being eligible for inclusion therein are located within the project area or will be affected by the proposed work. Presently, unknown archeological, scientific, prehistoric, or historical data may be located within the project area and/or could be affected by the proposed work.

Endangered Species

The Corps has reviewed the project area, examined all information provided by the applicant and consulted the latest North Carolina Natural Heritage Database. Based on available information, the Corps has determined there may be species listed as threatened or endangered or their critical habitat formally designated pursuant to the Endangered Species Act of 1973 (ESA) within the project area. A final determination on the effects of the proposed project will be made upon additional review of the project and completion of any necessary biological assessment and/or consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service.

Evaluation

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That

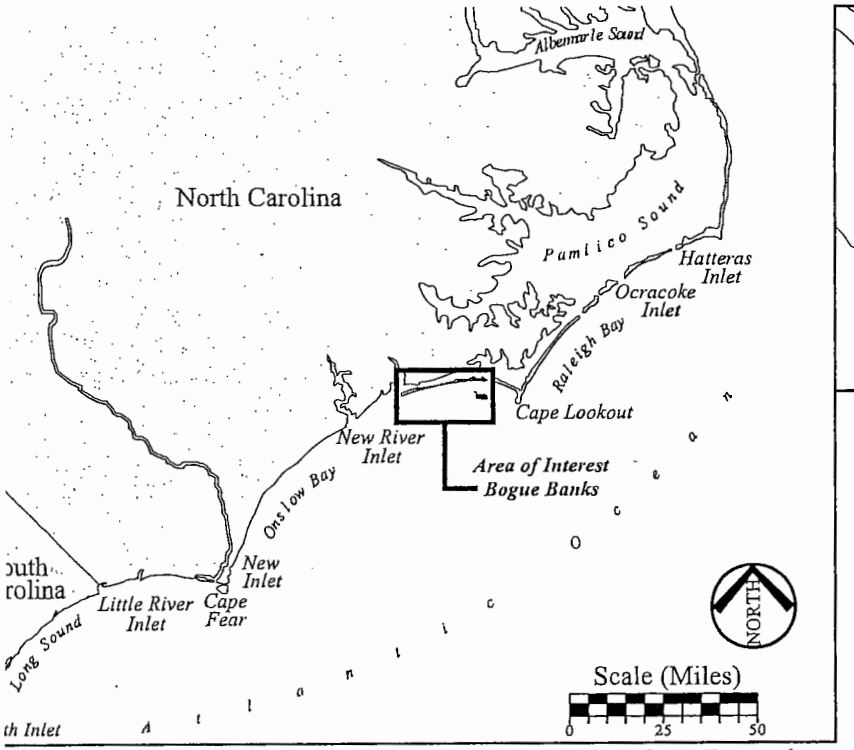
decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

Commenting Information

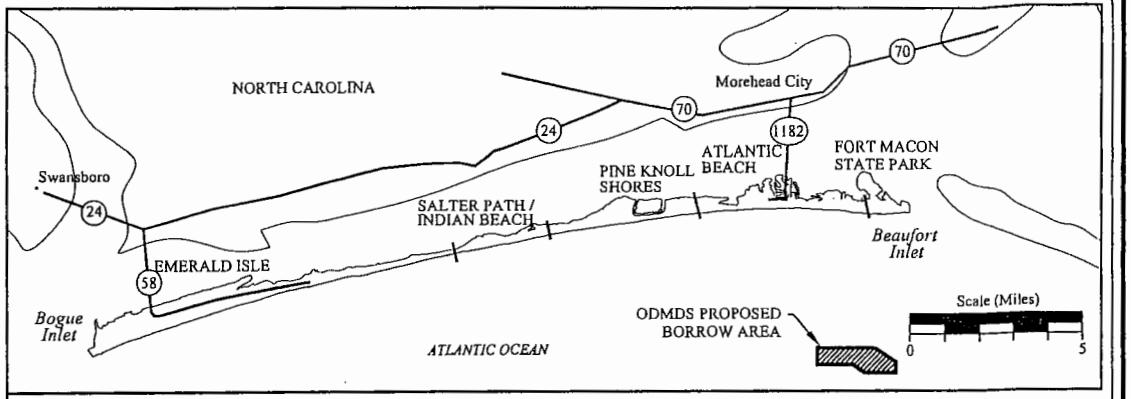
The Corps is soliciting comments from the public; Federal, State and local agencies and officials; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Requests for a public hearing shall be granted, unless the District Engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing.

Written comments pertinent to the proposed work, as outlined above, will be received by the Corps of Engineers, Wilmington District, until 5pm, August 7, 2006. Comments should be submitted to Dave Timpy, Project Manager for this project.



Project Location

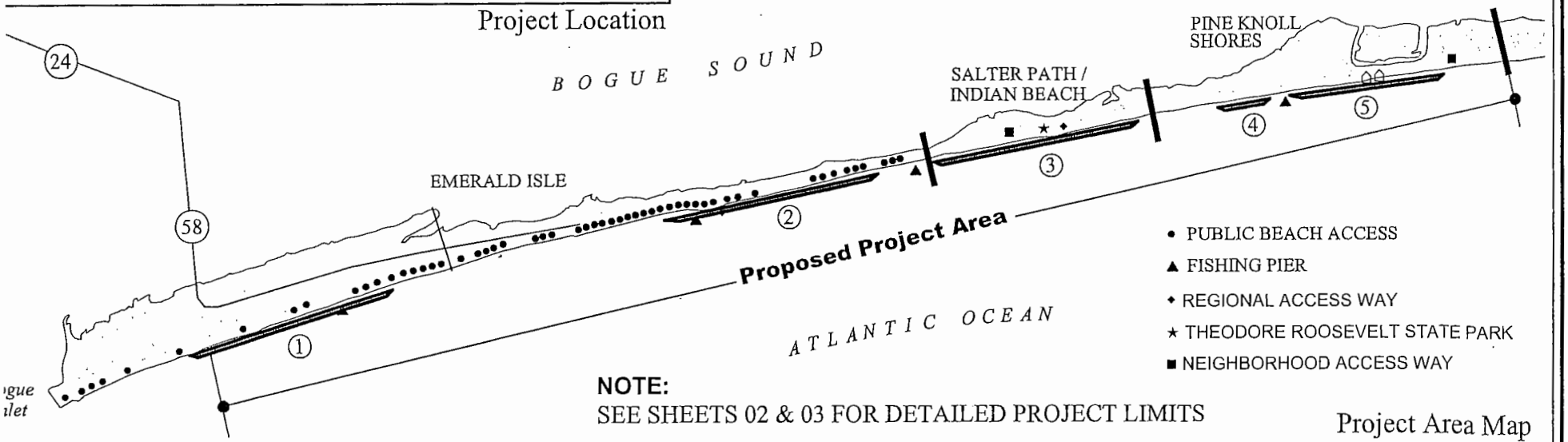


Bogue Banks Inset

Directions:

From Swansboro take Hwy 24 toward Morehead City. Turn right on Hwy 58 towards Emerald Isle. Follow signs to public beach access. (general locations below)

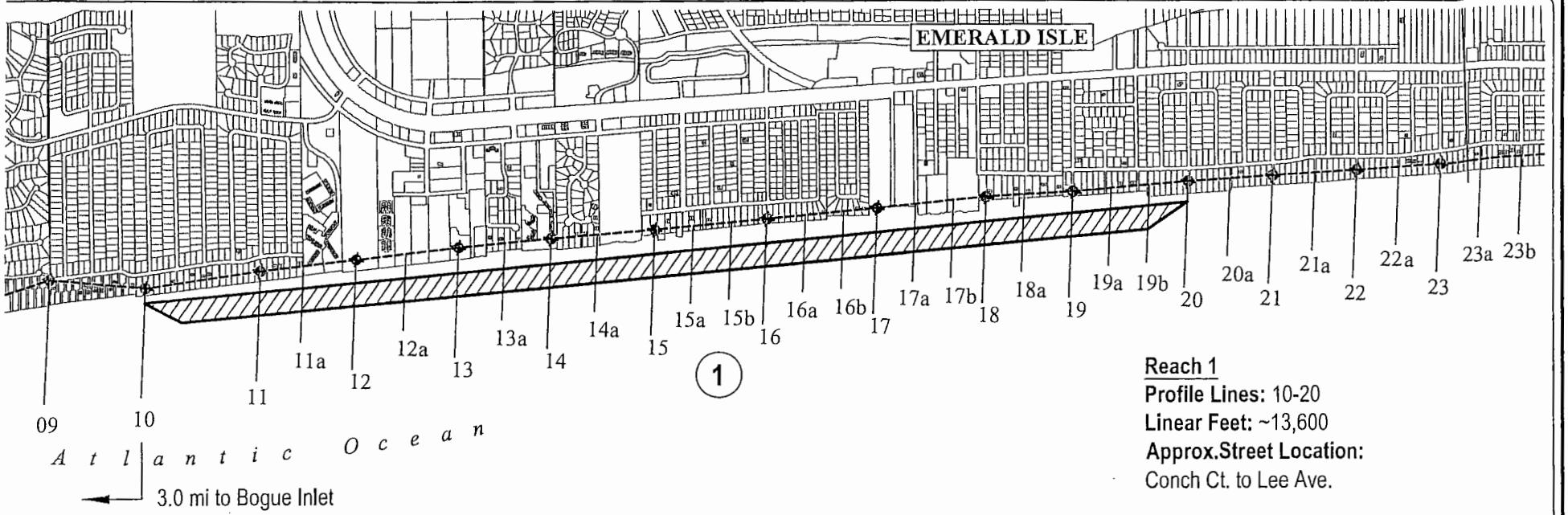
From Morehead City take Hwy 70 (Arendell Ave) towards Swansboro. Turn left on Hwy 1182 towards Atlantic Beach. Turn right at the first light onto Hwy 58. Follow signs to public beach access. (general locations below)



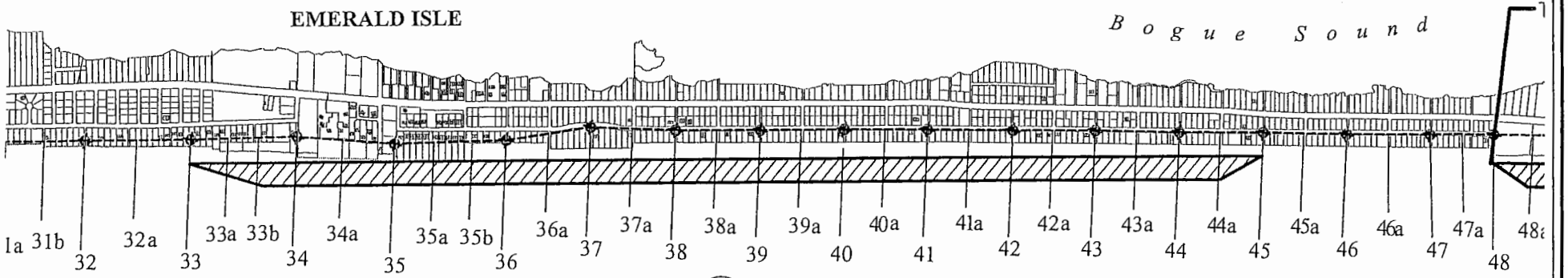
NOTE:
SEE SHEETS 02 & 03 FOR DETAILED PROJECT LIMITS

Project Area Map

PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:		
POST OPHELIA RE-NOURISHMENT PROJECT *FEMA 1608-DR-NC*	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH, & PINE KNOLL SHORES	**PROJECT LOCATION MAP**	SCALE: AS SHOWN DATE: MAY 2006 DRAWN BY: JJH PROJECT #: 2205	SHEET # **01** OF: 12



Reach 1
Profile Lines: 10-20
Linear Feet: ~13,600
Approx.Street Location:
Conch Ct. to Lee Ave.



Reach 2
Profile Lines: 33-45
Linear Feet: ~14,060
Approx.Street Location:
Gregg St. to 6th St.

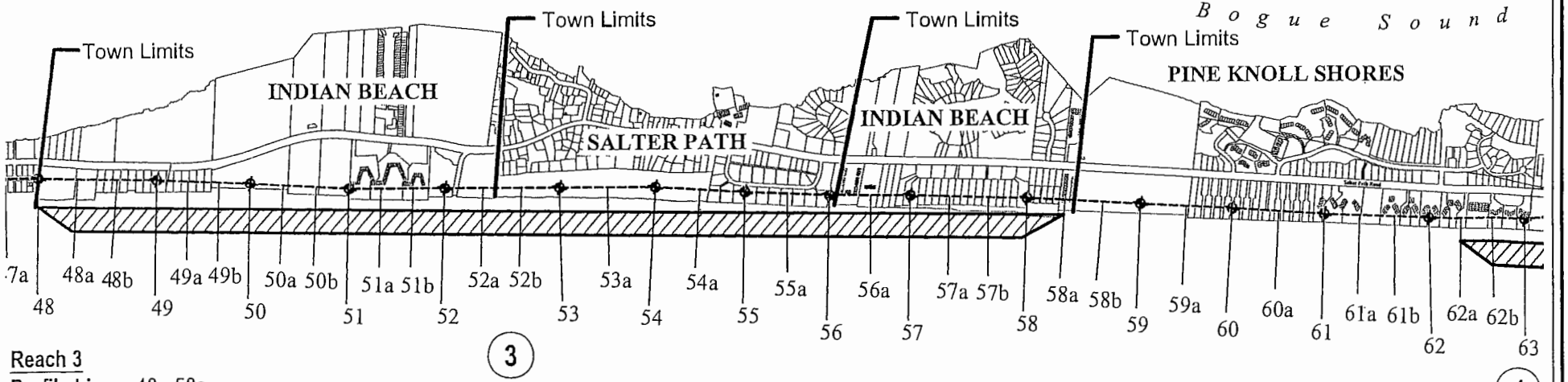
PROJECT TITLE:
POST OPHELIA RE-NOURISHMENT PROJECT
FEMA 1608-DR-NC

PREPARED FOR:
TOWN OF EMERALD ISLE,
INDIAN BEACH/SALTER PATH,
& PINE KNOLL SHORES

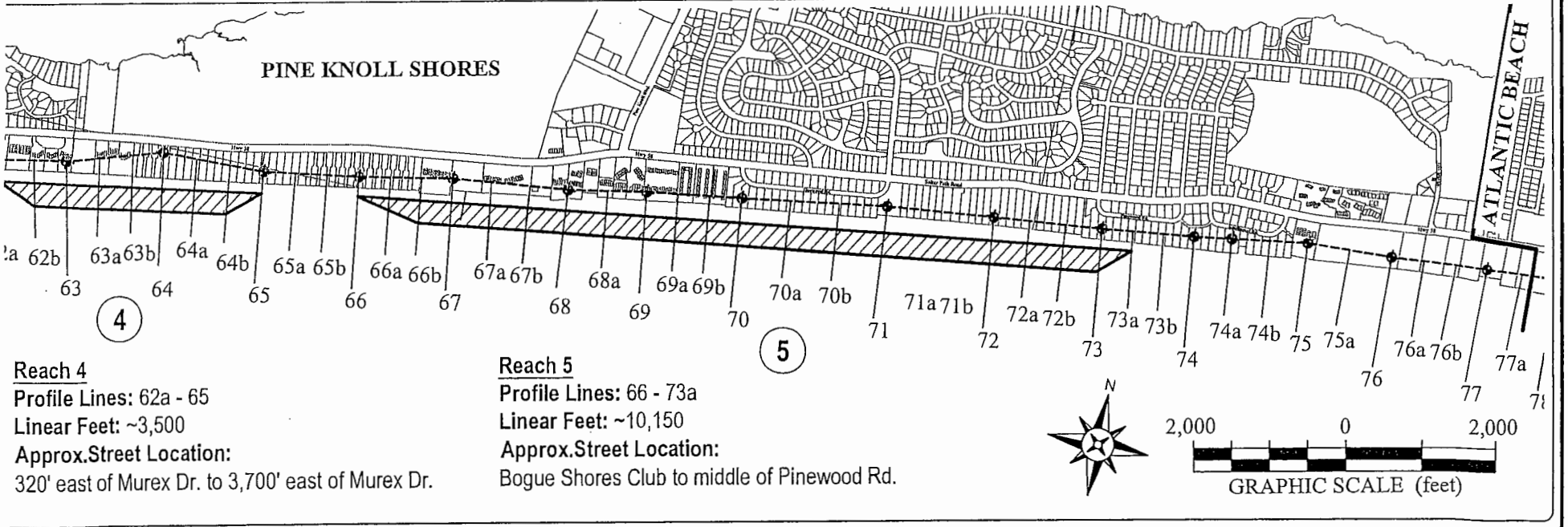
DRAWING TITLE:
REACHES 1 & 2
EMERALD ISLE

SCALE:	AS SHOWN
DATE:	MAY 2006
DRAWN BY:	JJH
PROJECT #:	2205

SHEET # 02
OF: 12



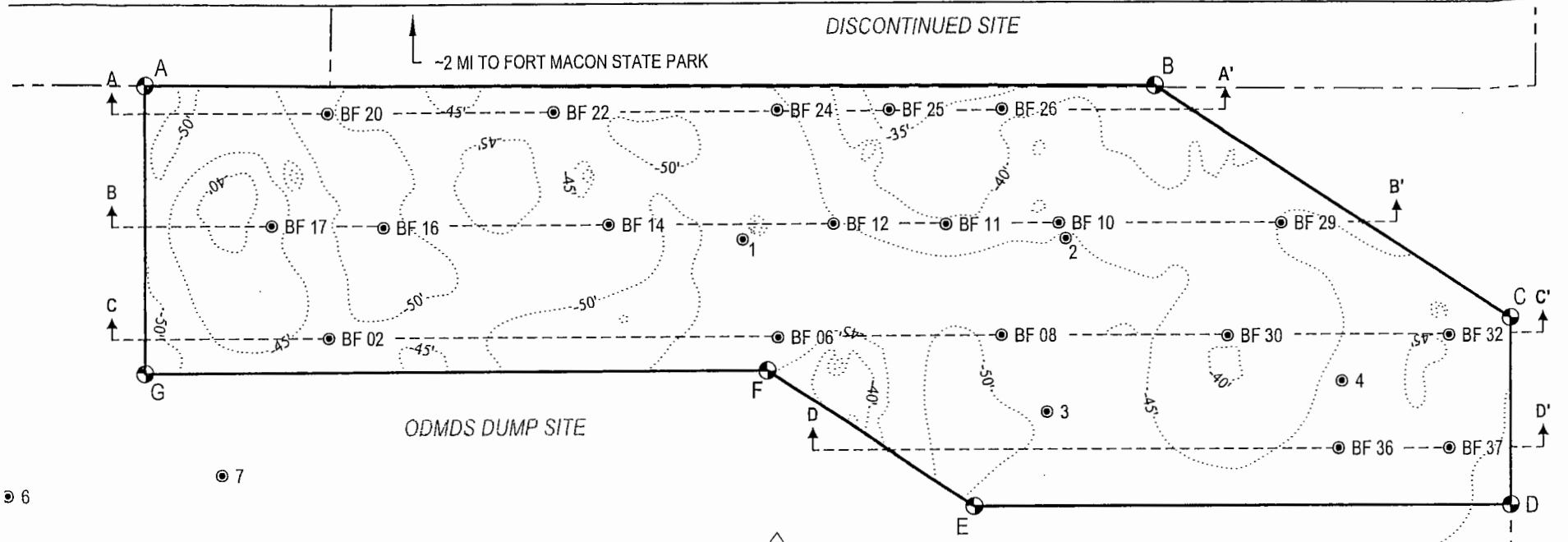
Reach 3
Profile Lines: 48 - 58a
Linear Feet: ~13,400
Approx.Street Location:
300' east of 1st St. to apartment complex at eastern town boundary.



Reach 4
Profile Lines: 62a - 65
Linear Feet: ~3,500
Approx.Street Location:
320' east of Murex Dr. to 3,700' east of Murex Dr.

Reach 5
Profile Lines: 66 - 73a
Linear Feet: ~10,150
Approx.Street Location:
Bogue Shores Club to middle of Pinewood Rd.

PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:	SCALE: AS SHOWN	SHEET #
POST OPHELIA RE-NOURISHMENT PROJECT *FEMA 1608-DR-NC*	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH, & PINE KNOLL SHORES	**REACHES 3, 4, & 5** INDIAN BEACH & PINE KNOLL SHORES	DATE: MAY 2006 DRAWN BY: JJH PROJECT #: 2205	03 OF: 12



DUMP SITE BUOY
(Approximate Location)

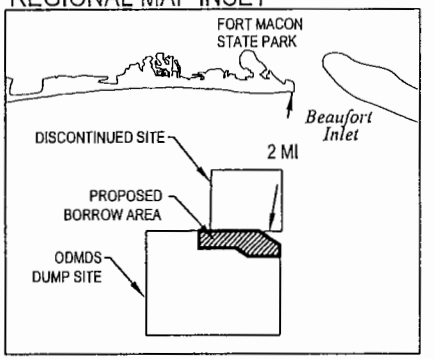
PROPOSED BORROW AREA COORDINATE CHART		
System: US State Plane 1983		
Zone: NC 3200 Datum: NAD 1983 (feet)		
NAME	*NORTHING*	*EASTING*
A	331,736.981	2,684,370.713
B	331,707.047	2,693,362.291
C	329,646.195	2,696,574.345
D	327,998.739	2,696,574.345
E	327,998.739	2,691,745.564
F	329,207.047	2,689,902.072
G	329,207.047	2,684,362.291
BUOY	327,622.000	2,689,984.000

CORES OBTAINED BY CSE
MAR 2004 THRU MAY 2006

PROPOSED BORROW AREA

ODMDS AREA (NOAA CHART 11541)

REGIONAL MAP INSET



1,200 0 600 1,200

GRAPHIC SCALE (IN FEET)

N

NOTES:
1. SEE SHEETS 4 AND 5 FOR BORROW AREA CROSS SECTIONS A-A' THRU D-D'
2. BATHYMETRY DATA COLLECTED BY CSE 6-8 MAY 2006 VIA TRIMBLE 5700 RTK GPS & ODOM SOUNDER

PROJECT TITLE:
POST OPHELIA RE-NOURISHMENT PROJECT
FEMA 1608-DR-NC

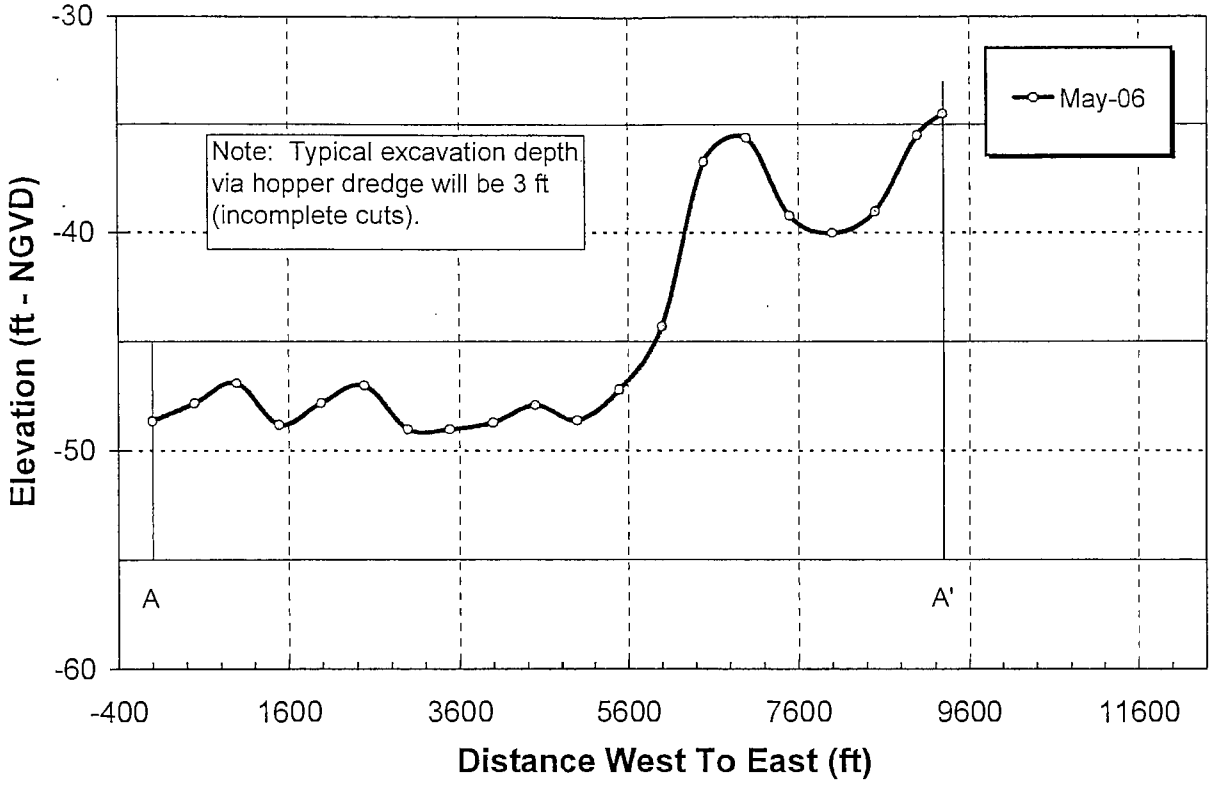
PREPARED FOR:
TOWN OF EMERALD ISLE,
INDIAN BEACH/SALTER PATH,
& PINE KNOLL SHORES

DRAWING TITLE:
BORROW AREA
CORE LOCATIONS,
BATHYMETRY

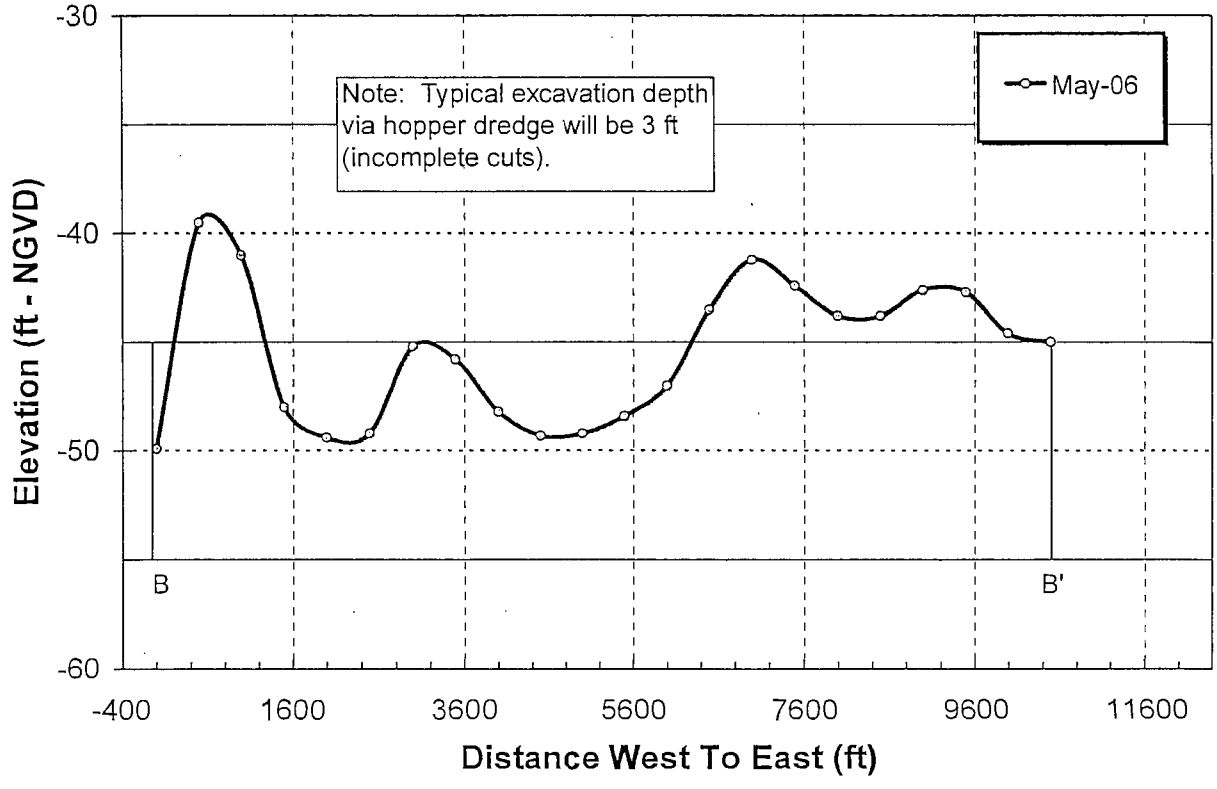
SCALE:	AS SHOWN
DATE:	MAY 2006
DRAWN BY:	JJH
PROJECT #:	2205

SHEET # 04 OF: 12

Borrow Area Cross Section A - A'

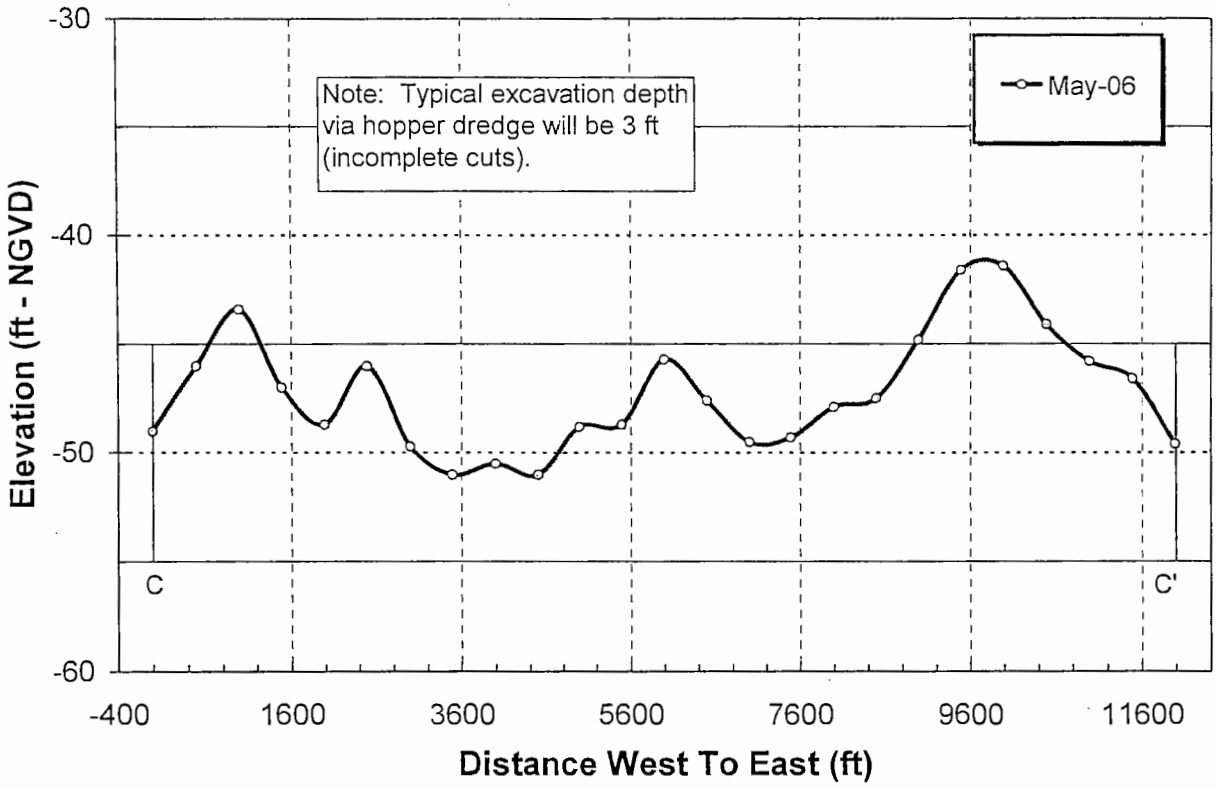


Borrow Area Cross Section B - B'

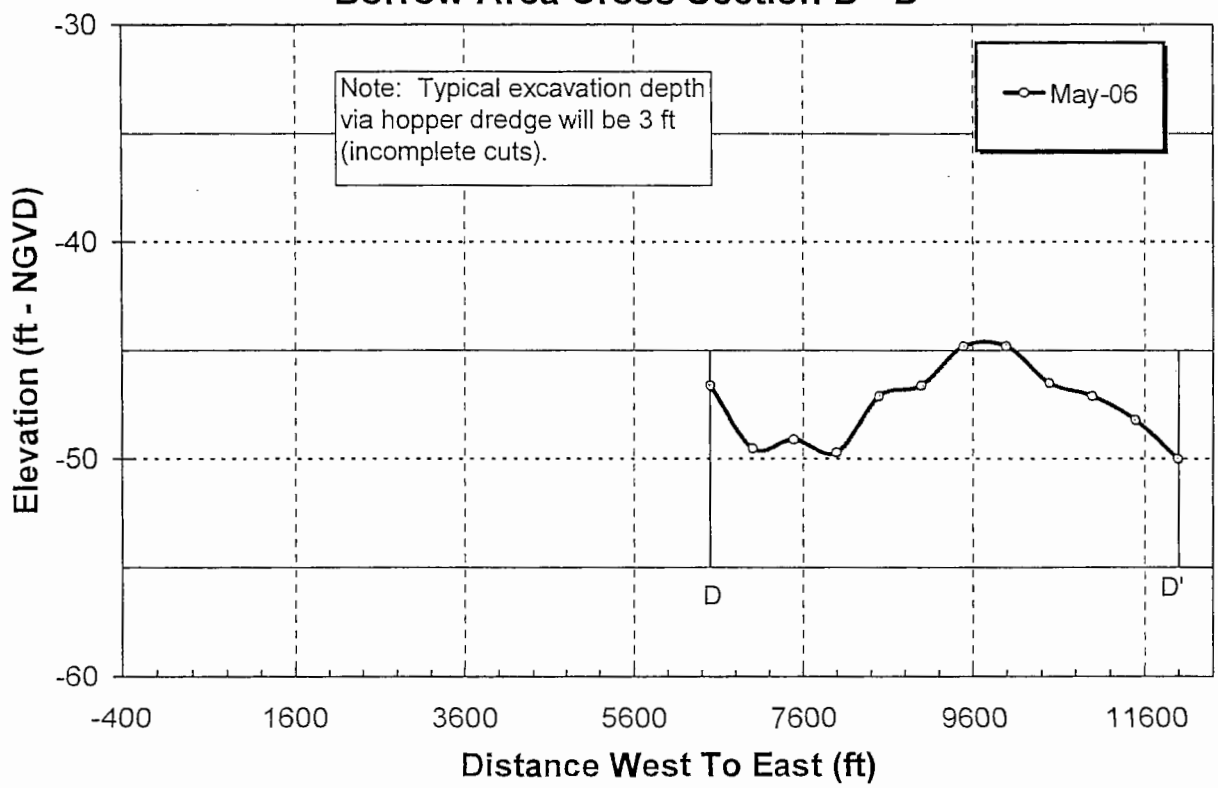


PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:		
POST OPHELIA RE-NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH,	BORROW AREA CROSS SECTIONS	SCALE: AS SHOWN DATE: MAY 2006 DRAWN BY: JJH	SHEET #: 05

Borrow Area Cross Section C - C'

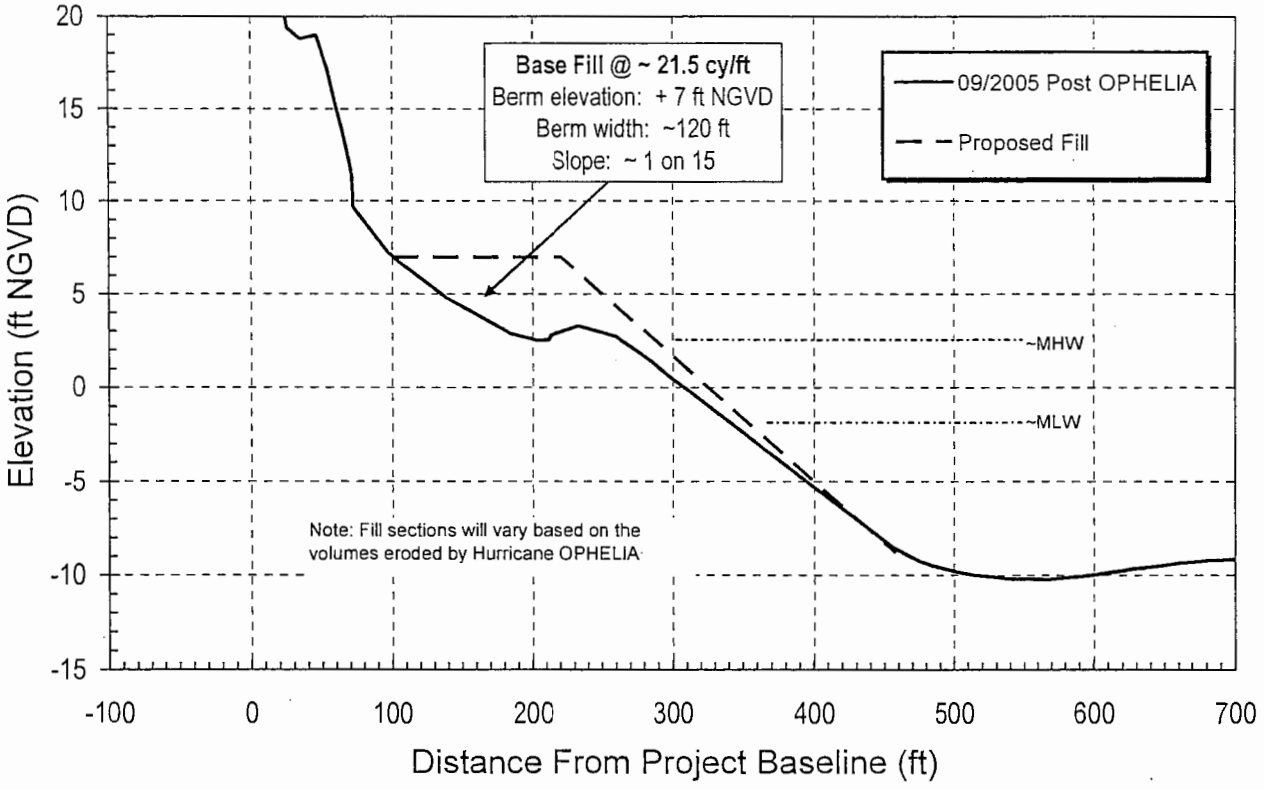


Borrow Area Cross Section D - D'

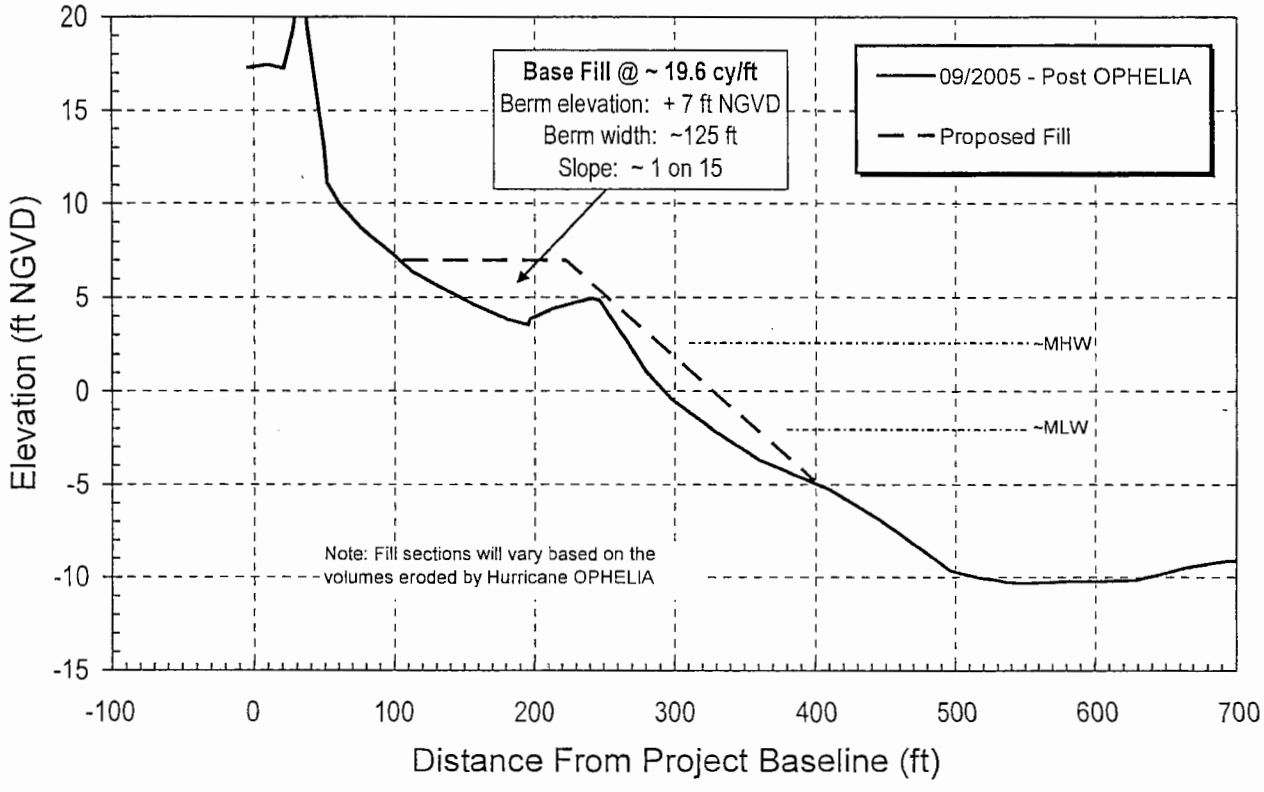


PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:		
POST OPHELIA RE-NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH,	BORROW AREA CROSS SECTIONS	SCALE: AS SHOWN DATE: MAY 2006 DRAWN BY: JJH	SHEET #: 06

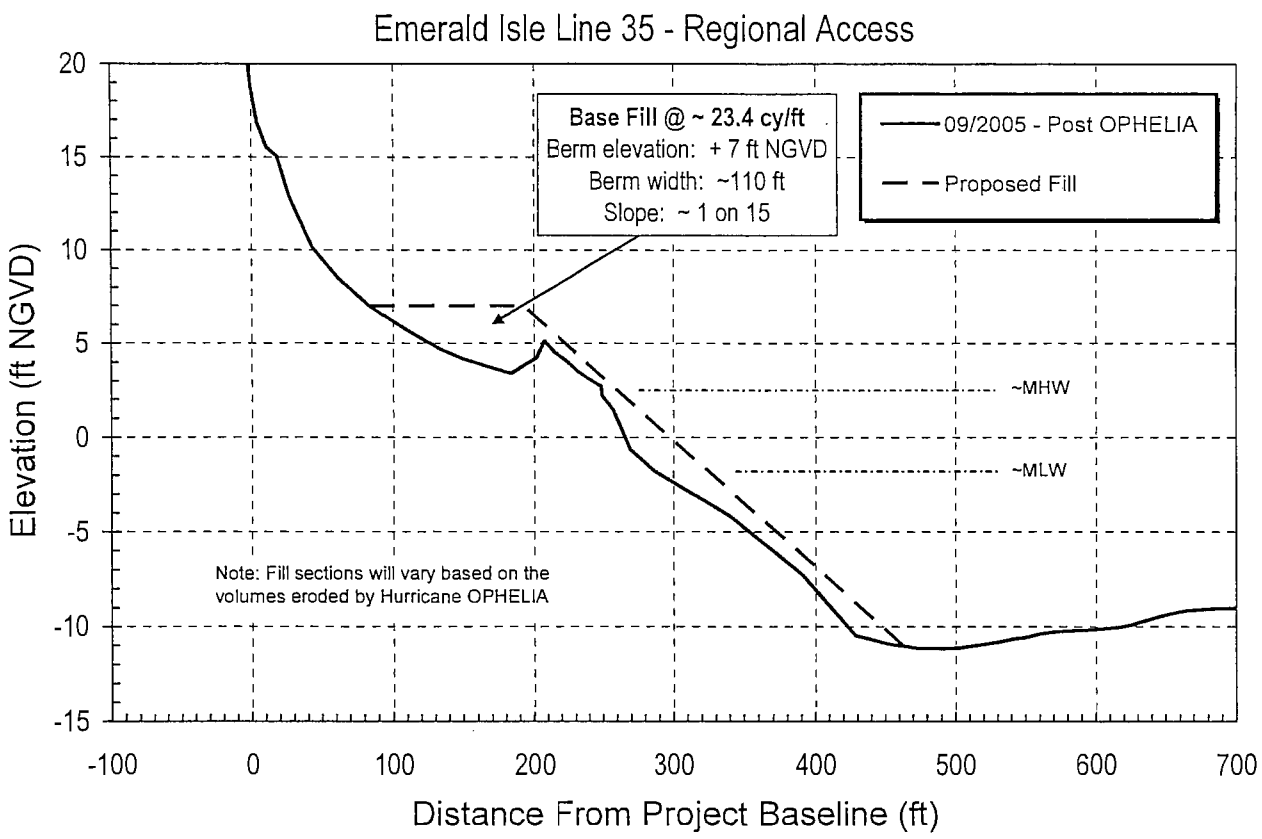
Emerald Isle Line 12

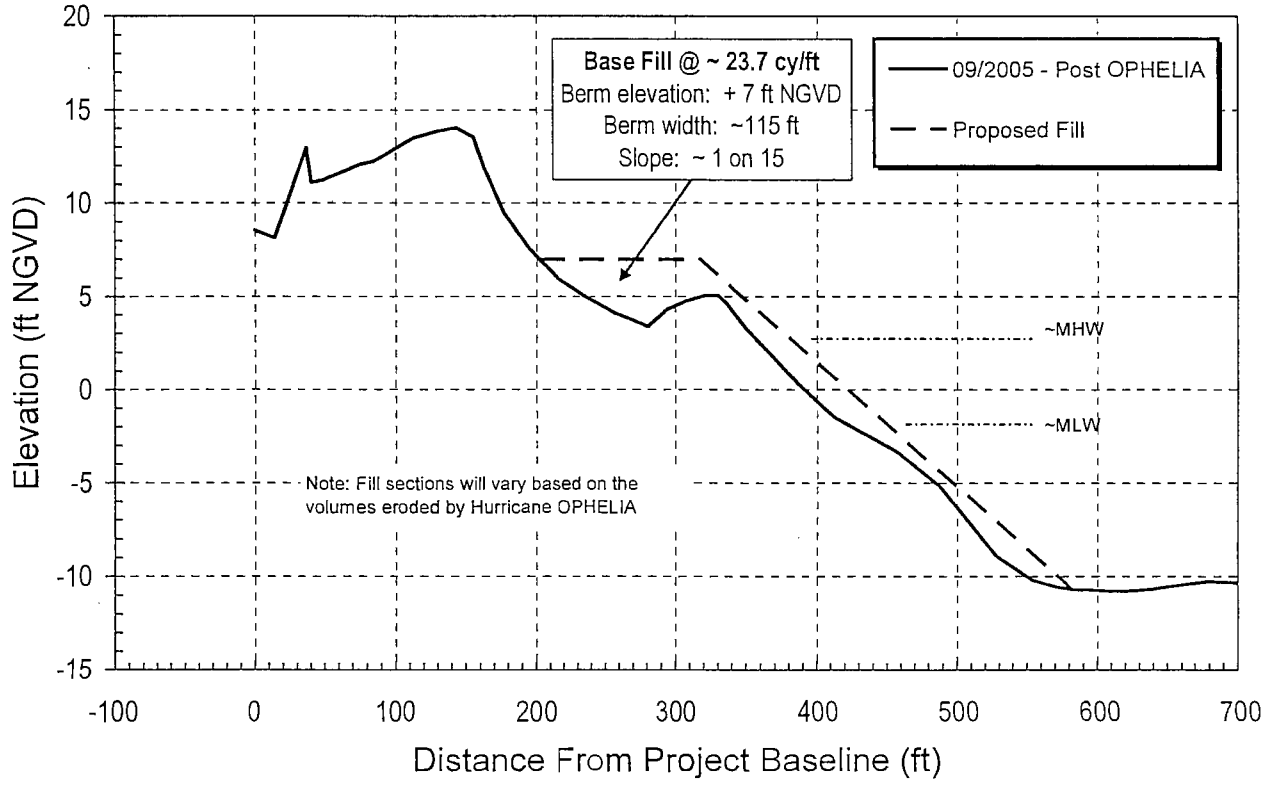


Emerald Isle Line 15



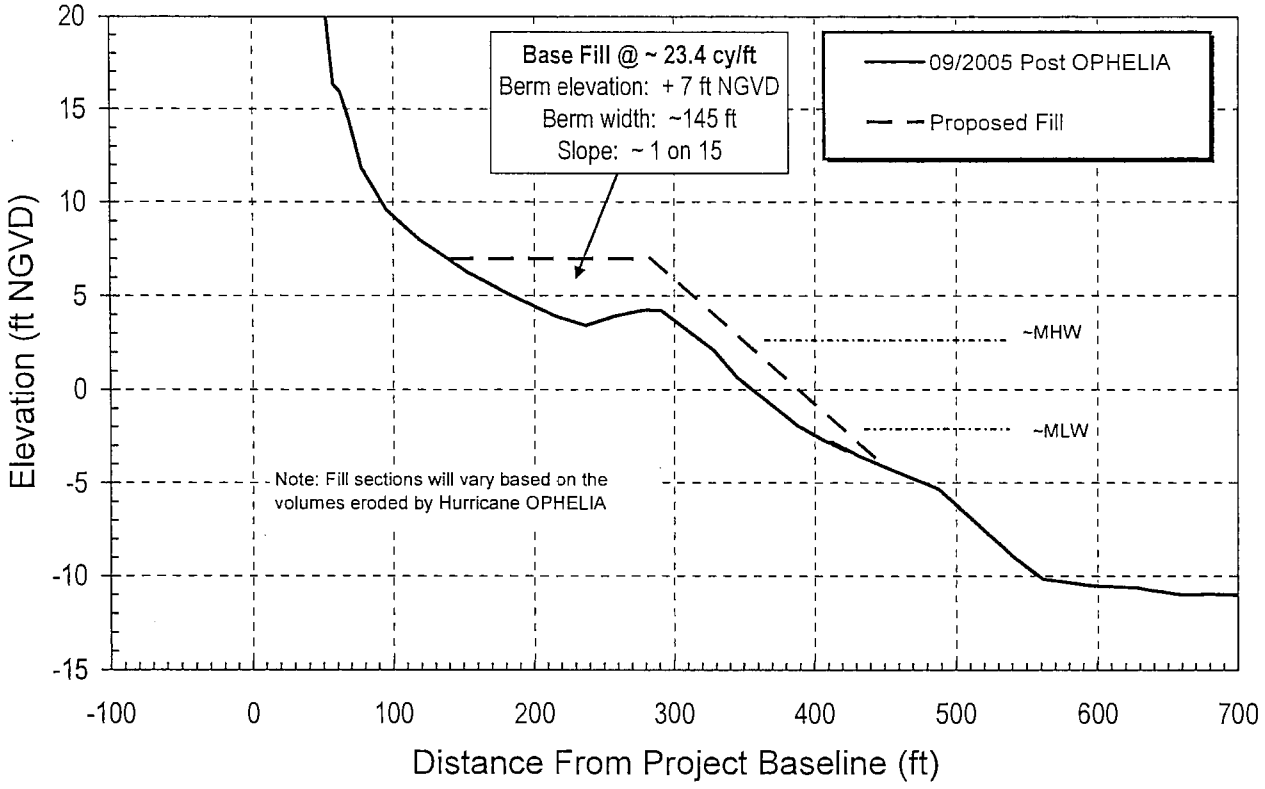
PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:	SCALE: AS SHOWN	SHEET #:
POST OPHELIA RE-NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH,	TYPICAL FILL SECTIONS EMERALD ISLE	DATE: MAY 2006	07
			DRAWN BY: JJH	



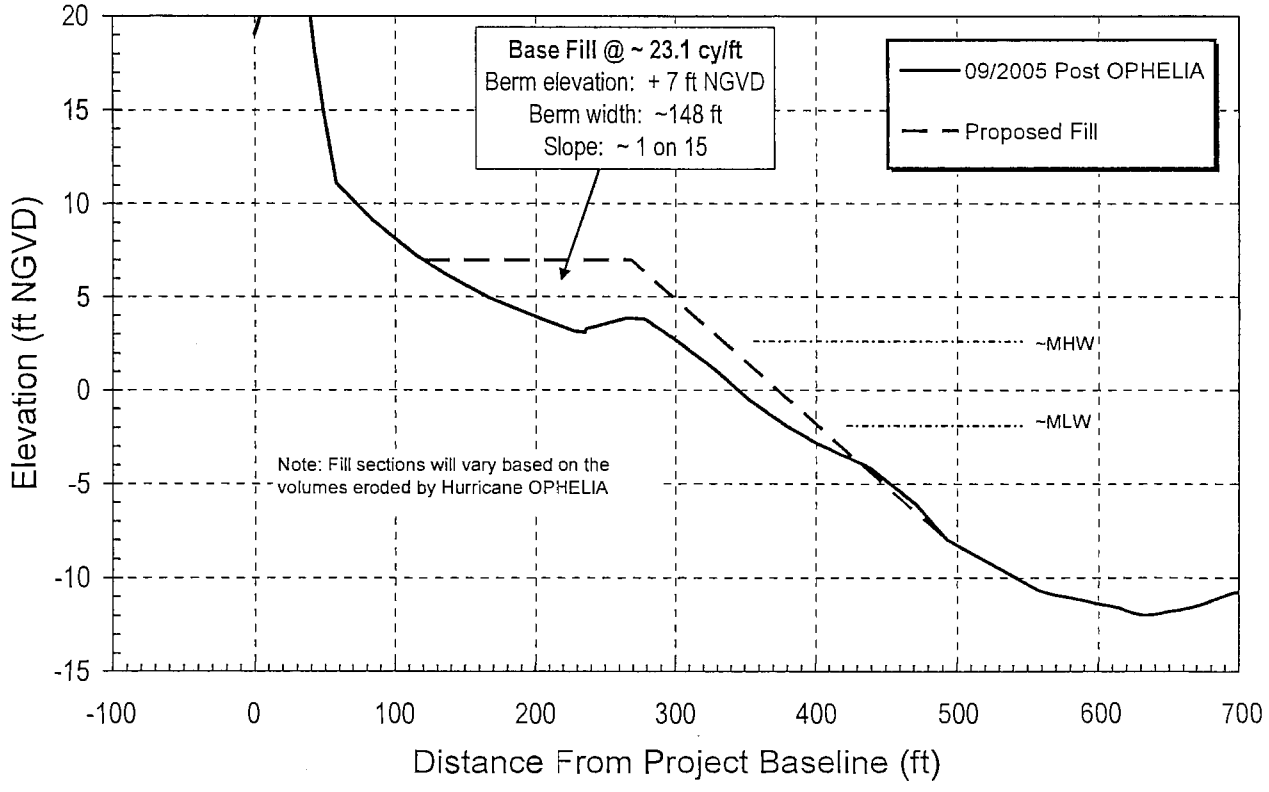


PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:	SCALE: AS SHOWN	SHEET #:
POST OPHELIA RE-NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH,	TYPICAL FILL SECTIONS	DATE: MAY 2006	08
			DRAWN BY: JJH	

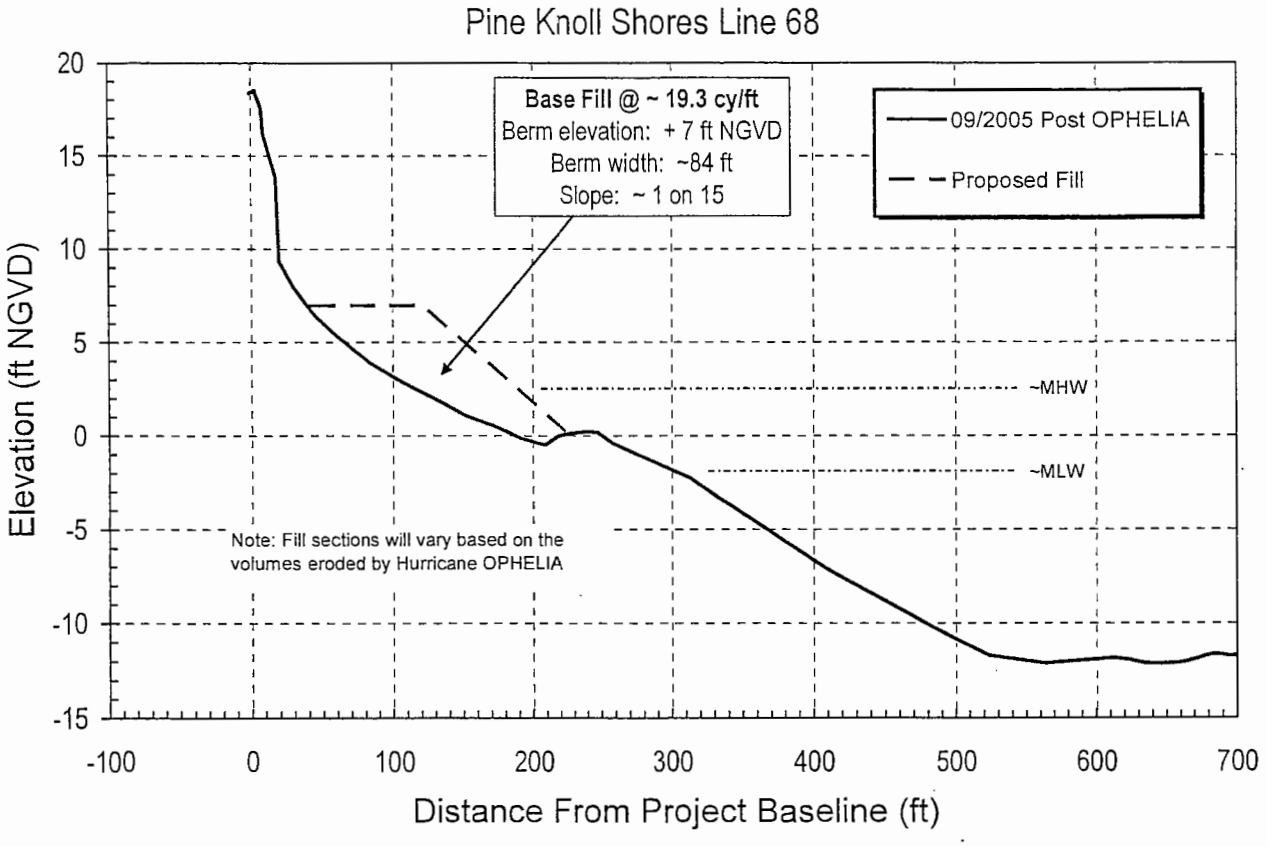
Salter Path/Indian Beach Line 50

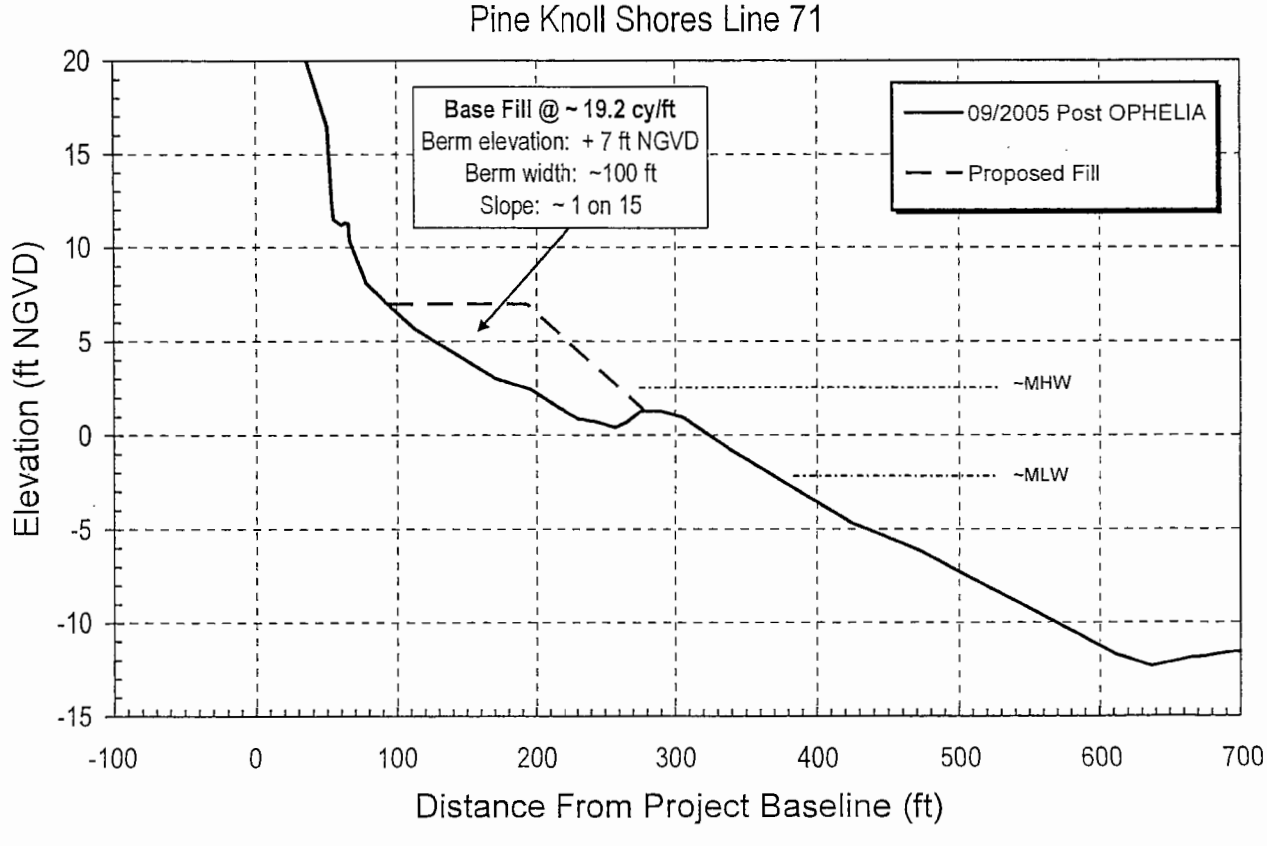


Salter Path/Indian Beach Line 55



PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:	SCALE: AS SHOWN	SHEET #:
POST OPHELIA BE NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH	TYPICAL FILL SECTIONS	DATE: MAY 2006	09
			DRAWN BY:	





PROJECT TITLE:	PREPARED FOR:	DRAWING TITLE:	SCALE: AS SHOWN	SHEET #:
POST OPHELIA RE-NOURISHMENT PROJECT	TOWN OF EMERALD ISLE, INDIAN BEACH/SALTER PATH,	TYPICAL FILL SECTIONS PINE KNOLL SHORES	DATE: MAY 2006	10
			DRAWN BY: JJH	

Bogue Banks	Beach and Potential Borrow Area Sediment Characteristics - Summary
	October 2005 Conditions

Beach Samples Locality	ID	Sample Position	Stations	Locality	Grain Size Distributions			%Coarser Than 2 mm	% Mud	% Shell	Sediment Description*
			(CSE Prof #)		Mean (mm)	Std Dev. (mm)	Skewness				
Island Composite	-	D-B-BF-LTT	10, 30, 50, 70, 90	Bogue Banks	0.302	0.585	-0.648	0.0	-	15.0	MS,mws,c-s
(Pre-nourishment 2001)											

Offshore Borrow Area (USACE - ODMDS)	ID	Limits (feet)	Water Depth (ft-NGVD)	Water Depth (ft-MLLW)	Grain Size Distributions			%Coarser Than 2 mm	% Mud	% Shell	Sediment Description*
					Mean (mm)	Std Dev. (mm)	Skewness				
Core BF 2	BF2-S1	0-3.75	-47.2	-45.7	0.238	0.574	-0.650	3.1	<2	ND	FS,ms,sc-s
	BF2-S2	3.75-4.8	-47.2	-45.7	0.248	0.448	-0.520	9.8	9.7	ND	MS,ps,sc-s
Core BF 6	BF6 S1	0-2.6	-48.5	-47.0	0.241	0.581	-0.674	3.7	<2	ND	FS,ms,sc-s
Core BF 8	BF8 S1	0-4.0	-49.1	-47.6	0.262	0.572	-0.591	3.3	<2	ND	MS,ms,sc-s
	BF8 S2	4.0-5.5	-49.1	-47.6	0.226	0.501	-0.745	7.7	2.3	ND	FS,ps,sc-s
Core BF 10	BF10 S1	0-3.0	-45.5	-44.0	0.293	0.546	-0.493	3.4	<2	ND	MS,ms,sc-s
	BF10 S2	3.0-6.0	-45.5	-44.0	0.356	0.500	-0.286	11.1	<2	ND	MS,ps,sc-s
	BF10 S3	6.0-8.0	-45.5	-44.0	0.250	0.624	-0.660	1.3	<2	ND	FS,mws,sc-s
Core BF 11	BF11 S1	0-1.0	-40.6	-39.1	0.326	0.609	-0.439	2.1	<2	ND	MS,ms,c-s
	BF11 S2	1.0-4.9	-40.6	-39.1	0.344	0.545	-0.429	5.2	<2	ND	MS,ps,sc-s
	BF11 S3	4.9-6.2	-40.6	-39.1	0.468	0.504	-0.104	13.6	<2	ND	CS,ps,sc-s
	BF11 S4	6.2-9.2	-40.6	-39.1	0.374	0.585	-0.343	3.9	<2	ND	MS,ms,sc-s
Core BF 12	BF12 S1	0-3.0	-46.5	-45.0	0.282	0.540	-0.493	4.7	<2	ND	MS,ms,sc-s

*CS - Coarse Sand
MS - Medium Sand
FS - fine sand
GR - Granule
P - Pebble

ms - moderately sorted
mws - moderately well sorted
ws - well sorted
ps - poorly sorted

c-s coarse skewed
sc-s strongly coarse skewed
f-s fine skewed
n-s - nearly symmetrical size distribution

** Averages are based on composite core-length averaged data

Note: All cores had only trace mud based on visual examination, therefore separate tests for mud were not performed

Note: Native Composite based on CSE-Stroud 2001 - Final Environmental Assessment, Bogue Banks Beach Nourishment Project, Carteret County, North Carolina

PROJECT TITLE:
POST OPHELIA RE-NOURISHMENT PROJECT
FEMA 1608-DR-NC

PREPARED FOR:
TOWN OF EMERALD ISLE,
INDIAN BEACH/SALTER PATH,
& PINE KNOLL SHORES

DRAWING TITLE:
BEACH & POTENTIAL BORROW AREA
SEDIMENT CHARACTERISTICS

SCALE: AS SHOWN
DATE: MAY 2006
DRAWN BY: JJH
PROJECT #: 2205
SHEET # 11
OF: 12

Offshore Borrow Area (USACE - ODMDS)	ID	Limits (feet)	Water Depth (ft-NGVD)	Water Depth (ft-MLLW)	Grain Size Distributions			%Coarser Than 2 mm	% Mud	% Shell	Sediment Description*
					Mean (mm)	Std Dev. (mm)	Skewness				
	BF12 S2	3.0-6.55	-46.5	-45.0	0.274	0.575	-0.575	4.0	<2	ND	MS,ms,sc-s
Core BF 14	BF14 S1	0-2.75	-47.7	-46.2	0.226	0.551	-0.508	2.5	1.4	ND	FS,ms,sc-s
	BF14 S2	2.75-4.4	-47.7	-46.2	0.354	0.541	-0.282	5.3	<2	ND	MS,ps,sc-s
	BF14 S3	4.4-5.8	-47.7	-46.2	0.207	0.538	-0.790	4.3	<2	ND	FS,ms,sc-s
Core BF 16	BF16 S1	0-2.1	-49.6	-48.1	0.232	0.639	-0.581	0.4	<2	ND	FS,mws,c-s
	BF16 S2	2.1-4.7	-49.6	-48.1	0.240	0.563	-0.581	3.7	3.1	ND	FS,ms,sc-s
Core BF 17	BF17 S1	0-1.0	-43.6	-42.1	0.567	0.488	0.141	22.8	<2	ND	CS,ps,c-s
	BF17 S2	1.0-4.0	-43.6	-42.1	0.267	0.600	-0.755	3.3	<2	ND	MS,ms,sc-s
	BF17 S3	4.0-4.7	-43.6	-42.1	0.166	0.668	-1.133	0.1	<2	ND	FS,ws,ns
Core BF 20	BF20 S1	0-2.8	-49.7	-48.2	0.231	0.579	-0.617	1.6	<2	ND	FS,ms,sc-s
	BF20 S2	2.8-3.7	-49.7	-48.2	0.326	0.507	-0.321	6.8	<2	ND	MS,ps,sc-s
Core BF 22	BF22 S1	0-2.6	-48.8	-47.3	0.378	0.532	-0.264	7.8	<2	ND	MS,ps,sc-s
	BF22 S2	2.6-3.5	-48.8	-47.3	0.168	0.572	-0.984	2.2	<2	ND	FS,mws,sc-s
Core BF 24	BF24 S1	0-3.0	-45.3	-43.8	0.247	0.570	-0.572	2.7	<2	ND	FS,ms,sc-s
	BF24 S2	3.0-6.95	-45.3	-43.8	0.305	0.541	-0.409	5.5	<2	ND	MS,ps,sc-s
Core BF 25	BF25 S1	0-3.0	-32.7	-31.2	0.393	0.521	-0.188	5.7	<2	ND	MS,ps,c-s
	BF25 S2	3.0-6.8	-32.7	-31.2	0.301	0.535	-0.451	5.1	<2	ND	MS,ps,sc-s
Core BF 26	BF26 S1	0-1.7	-38.4	-36.9	0.267	0.545	-0.475	1.8	<2	ND	MS,ms,sc-s
	BF26 S2	1.7-4.6	-38.4	-36.9	0.325	0.519	-0.309	4.6	<2	ND	MS,ps,sc-s
	BF26 S3	4.6-6.5	-38.4	-36.9	0.244	0.566	-0.665	4.4	<2	ND	FS,ms,sc-s
				Averages**	0.292	0.482	-0.304	5.3	<2	ND	MS,ms,sc-s
				(excluding Core 5)							

ogue Banks Post-Ophelia Renourishment Project - Proposed Borrow Source - USACE ODMDS off Beaufort Entrance Channel

verfill Ratios Based On June 1999 to Nov 2001 Native Beach Samples (Source: CSE 2004) and ODMDS Offshore Cores

Native Beach	Mean(mm)	0.302		Mean (phi)	1.760
Composite-7-All	Std.Dev(mm)	0.585		Std.Dev(phi)	0.77

Sample ID	Limits (feet)	Sediment Description**	% Mud to indicated sample interval	Moment Measures		X	Y	Overfill Ratio (R_A)
				M-phi-b	Sigma-b	(Mb-Mn)/SDn	(SDb/SDn)	
Composite	Composite	CS,ps,c-s	<1	1.710	1.060	-0.06	2.12	1.35
	Averages							

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PROJECT #:	2205

SHEET # 12 OF: 12